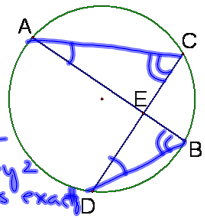
10.6 Find Segment Lengths in Circles

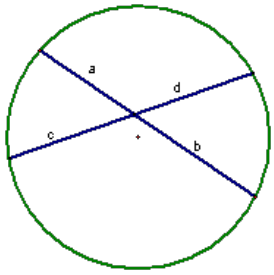
Given: picture
Prove: AExEB = CExDE



S.	R.
① Draw $\overline{AC}$ + $\overline{DB}$	① Through any 2 pts there is exactly one line
② $\angle A \cong \angle D$, $\angle C \cong \angle B$	② If 2 inscribed $\angle$s intercept the same arc, then they are $\cong$
③ $\triangle ACE \sim \triangle DBE$	③ AA~
④ $\frac{AE}{DE} = \frac{CE}{BE}$	④ Corr sides of ~$\triangle$s are proportional
⑤ $AE \cdot BE = CE \cdot DE$	⑤ Cross Multiply

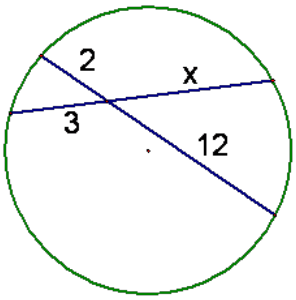
Theorem 10.14-Segments of Chords Theorem--If 2 chords intersect in a circle, then the products of the lengths of the segments of the chords are equal.

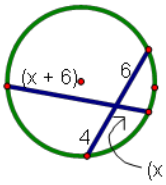
$a \cdot b = c \cdot d$



$3x = 2 \cdot 12$

$x = 8$





$x = 2$

$4 \cdot 6 = (x+1)(x+6)$

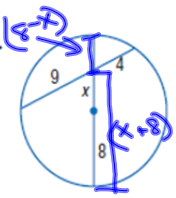
$24 = x^2 + 7x + 6$

$0 = x^2 + 7x - 18$

$(x+9)(x-2)$

$x = -9$ $x = 2$

22.



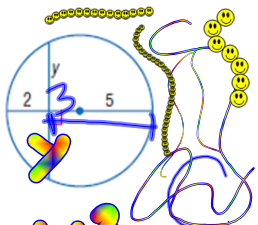
$(8+x)(8-x) = 4 \cdot 9$

$64 - x^2 = 36$

$-x^2 = -28$

$x = \pm 2\sqrt{7}$ $\sqrt{x^2} = \sqrt{28}$

23.



$y^2 = 8 \cdot 2$

$y^2 = 16$

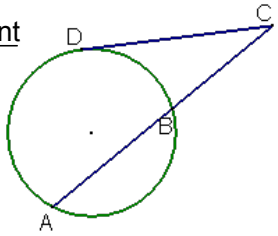
$y = \pm 4$

$y = 4$

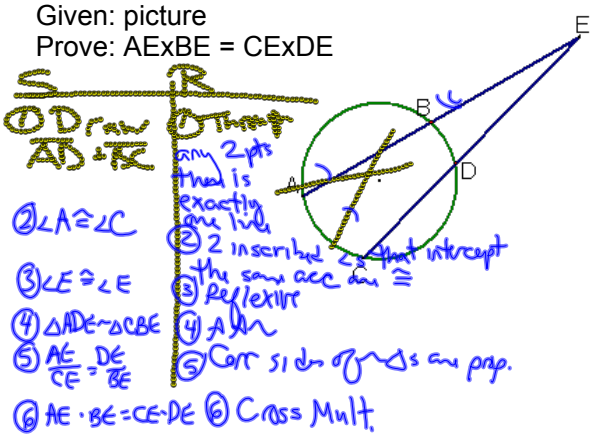
Secant segment--is a segment that contains a chord of a circle and has exactly one endpoint outside the circle.

External segment BC

Tangent segment DC

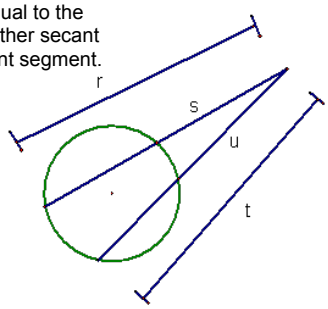


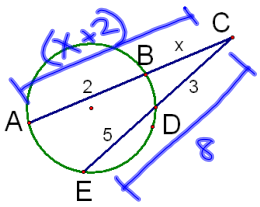
Given: picture
Prove: AExBE = CExDE



Theorem 10.15-Segments of Secants Theorem--If two secants share the same exterior point, then the product of the lengths of one secant segment and its external secant segment is equal to the product of the lengths of the other secant segment and its external secant segment.

$r \cdot s = t \cdot u$





$x(x+2) = 8 \cdot 3$

$x^2 + 2x = 24$

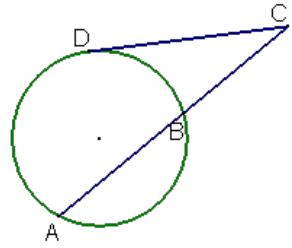
$x^2 + 2x - 24 = 0$

$(x+6)(x-4)$

$x = -6$ $x = 4$

Theorem 10.16-Segments of Secants and Tangents Theorem-- If a tangent segment and a secant segment share an exterior point, then the (length of the tangent segment)^2 = the product of the lengths of the secant segment and its external secant segment

$DC^2 = AC \cdot BC$



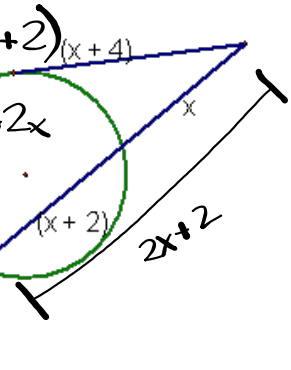
$(x+4)^2 = x(2x+2)$

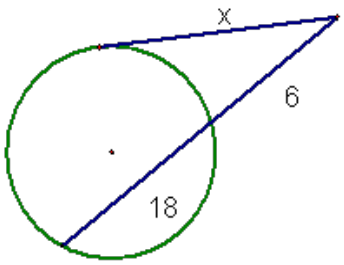
$x^2 + 8x + 16 = 2x^2 + 2x$

$0 = x^2 - 6x - 16$

$(x-8)(x+2)$

$x = 8$ $x = -2$





Homework:
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3-10, 16, 18, 26